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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/567,177	02/03/2006	Erlind M. Thorsteinson	62575A	6742
35503	7590	02/02/2010		
Union Carbide Chemicals and Plastics Technology Corporation P.O. Box 1967 Midland, MI 48641-1967			EXAMINER	
			MICALL, JOSEPH	
			ART UNIT	PAPER NUMBER
			1793	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/567,177

**Applicant(s)**

THORSTEINSON, ERLIND M.

**Examiner**

Joseph V. Micali

**Art Unit**

1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 November 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/22)
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date: \_\_\_\_\_

### **DETAILED ACTION**

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on November 24<sup>th</sup>, 2009 has been entered.

#### ***Status of Application***

The amendments/argumentation filed on November 24<sup>th</sup>, 2009 has been entered. Claims 1-10 are pending and presented for examination on the merits, as claims 11-52 have been cancelled.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1793

**3. Claims 1-3 and 6-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over by US Patent No. 5,929,259 by Lockemeyer (1), in view of US Patent Pub. No. 2002/0143197 by Lockemeyer (2) and US Patent No. 6,398,998 by Lockemeyer (3).**

With respect to claims 1-2, Lockemeyer (1) is drawn to the preparation of ethylene oxide and catalyst (**title**). Specifically, Lockemeyer (1) discloses the formation of an alpha-alumina-based catalyst carrier (preformed, i.e. forming, shaping, drying, and firing) and subsequently impregnating with a titania modifier in an aqueous medium, calcining the impregnated carrier, and finally depositing silver catalytic material on the carrier (**column 2, lines 43-56 and claim 1**).

However, Lockemeyer (1) is silent with regards to (I) the modifier being at least one alkali metal hydroxide aqueous solution and (II) a washing step prior to the deposition of the catalytic material on the calcined carrier.

Lockemeyer (2) is drawn to a catalyst composition (**title**). Specifically, Lockemeyer (2) discloses an alpha-alumina carrier (**paragraph 0027**) being preferably impregnated with metal compounds, complexes, and/or salts (**paragraph 0015**) such as Group IA (alkali) metals (**paragraph 0024**), with sodium hydroxide in an aqueous solution being selected in examples (**paragraph 0036**).

At the time of invention it would have been obvious to a person of ordinary skill in the art to perform the process of Lockemeyer (1) including a modifier being at least one alkali metal hydroxide aqueous solution, in view of the teaching of Lockemeyer (2). The suggestion or motivation for doing so would have been to include a modifier known

Art Unit: 1793

in the art to work effectively in improving several catalytic properties of the catalyst (Lockemeyer (2), paragraph 0015).

Lockemeyer (3) is drawn to a process for preparing a catalyst with improved catalytic properties (title). Specifically, Lockemeyer (3) discloses a step of washing the alpha-alumina-based carrier prior to the deposition of the catalytic material (column 4, line 65, and column 5, lines 20-40).

At the time of invention it would have been obvious to a person of ordinary skill in the art to perform the process of Lockemeyer (1) including a washing step prior to the deposition of the catalytic material on the calcined carrier, in view of the teaching of Lockemeyer (3). The suggestion or motivation for doing so would have been to cleanse the carrier efficiently and cost-effectively in order to reduce the concentration of undesirable ionizable species and prepare the carrier for deposition/impregnation of the catalytically reactive metal (Lockemeyer (3), column 5, lines 28-40).

With respect to claim 3, Lockemeyer (1) discloses calcination being carried out at a temperature of 1200-1500° C (claim 1), which is within the range of 800-1800° C.

With respect to claims 6-7, Lockemeyer (2) discloses the selection of efficiency-enhancing promoters, such as Group VIIA metals (paragraphs 0015 and 0023-0024), which includes rhenium-containing compounds.

With respect to claim 8, such a limitation is drawn toward intended use of the claim method (see the claim language of “a catalyst to be used for the vapor phase epoxidation of alkene”), and thus, does not impart any patentable relevance on the actual claim limitations, i.e. the process steps.

With respect to claim 9, Lockemeyer (2) discloses an alpha-alumina carrier (**paragraph 0027**) being preferably impregnated with metal compounds, complexes, and/or salts (**paragraph 0015**) such as Group IA (alkali) metals (**paragraph 0024**), with sodium hydroxide in an aqueous solution being selected in examples (**paragraph 0036**). **MPEP 2144.05 [R-5]** states, "Generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical. '[W]here the general conditions of a claim are disclosed in the prior art, it is not inventive to discover the optimum or workable ranges by routine experimentation.'" As such is the case with the Lockemeyer references, such a range is rendered obvious by routine experimentation.

With respect to claim 10, Lockemeyer (2) discloses the alkali metal hydroxide being sodium hydroxide (**paragraph 0036**).

**4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,929,259 by Lockemeyer (1), in view of US Patent Pub. No. 2002/0143197 by Lockemeyer (2) and US Patent No. 6,398,998 by Lockemeyer (3), as applied to claims 1-3 and 6-10 above, in view of US Patent No. 4,994,589 by Notermann.**

With respect to claim 4, Lockemeyer, as combined, does not teach the shaped alpha-alumina carrier having a morphology comprising interlocking platelets.

Notermann teaches a process for epoxidation of an alkene including a supported silver catalyst. Specifically, the support consists essentially of alpha-alumina and the support particles have platelet-type morphology (**claim 1**). These platelets are shown to be interlocking (**Figure 1 as well as column 13, lines 8-14**). Both Boxhoorn and

Art Unit: 1793

Notermann teach a silver-containing catalyst on an alpha-alumina carrier support and different types of morphologies the carrier could take.

At the time of invention it would have been obvious to a person having ordinary skill in the art to perform the modified process of Lockemeyer including an interlocking platelet morphology, in view of the teaching of Notermann. The suggestion or motivation for doing so would have been to improve crush strength, pore volumes, and surface areas, thereby providing high performance characteristics of short term stability or high activity and long term stability (Notermann, column 13, lines 17-22).

**5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,929,259 by Lockemeyer (1), in view of US Patent Pub. No. 2002/0143197 by Lockemeyer (2) and US Patent No. 6,398,998 by Lockemeyer (3), as applied to claims 1-3 and 6-10 above, in view of US Patent No. 4,874,739 by Boxhoorn.**

With respect to claim 5, Lockemeyer, as combined, is silent with regards to the preparation of the alpha-alumina carrier by contacting boehmite alumina and/or gamma-alumina with an acidic mixture containing halide anions and water, although Lockemeyer (1) discloses a boehmite precursor (column 4, lines 19-20).

Boxhoorn teaches a process for the preparation of a silver-containing catalyst suitable for the oxidation of ethylene to ethylene oxide. Specifically, Boxhoorn teaches a step of impregnating a preformed alpha-alumina carrier (claim 1), which has been subjected to calcining and, optionally, other preforming treatments, as part of the preforming process (claim 1 and column 2, lines 44-66), with at least one alkali metal hydroxide modifier (claim 3 with respect to claim 1, step c). Boxhoorn teaches an

Art Unit: 1793

optional step of drying the impregnated carrier (**column 4, lines 16-20**). Boxhoorn also teaches a step of washing the final carrier (**column 5, lines 8-11 and lines 30-35**).

Furthermore, with respect to claim 5, Boxhoorn teaches a method wherein the alpha-alumina carrier is prepared by contacting boehmite alumina and/or gamma-alumina with an acidic mixture containing halide anions and water (**claim 2 and column 1, line 54 - column 2, line 2**).

At the time of invention it would have been obvious to a person having ordinary skill in the art to perform the modified process of Lockemeyer including preparation of the alpha-alumina carrier by contacting boehmite alumina and/or gamma-alumina with an acidic mixture containing halide anions and water, in view of the teaching of Boxhoorn. The suggestion or motivation for doing so would have been to the use of a known technique for making alpha-alumina carriers to improve other similar devices/processes in the same way (**Boxhoorn, column 1, line 54 - column 2, line 2**).

#### ***Response to Arguments***

**6. Applicant's arguments with respect to the current claim set have been considered but are moot in view of the new ground(s) of rejection.**

With respect to applicant's argumentation, applicant's arguments are no longer valid, as the examiner has removed all the rejections based on Boxhoorn in view of Cheung. As all argumentation was drawn to this combination and these references, there is no longer any argumentation left for the examiner to respond to.

#### ***Conclusion***

**7. Claims 1-10 are rejected.**



Art Unit: 1793

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph V. Micali whose telephone number is (571) 270-5906. The examiner can normally be reached on Monday through Friday, 7:30am to 5pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jerry A. Lorengo can be reached on (571) 272-1233. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph V Micali/  
Examiner, Art Unit 1793

/J.A. LORENZO/  
Supervisory Patent Examiner, Art Unit  
1793